23722

Enforcement Decision Document
Remedial Alternative Selection
Lees Lane Landfill Site
Louisville, Kentucky

SITE LOCATION AND DESCRIPTION

The Lees Lane Landfill site is located adjacent to the Ohio River in Jefferson County, approximately 4.5 miles southwest of Louisville, Kentucky. The site, consisting of 112 acres, is approximately 5,000 feet in length and 1,500 feet in width (see Figure 1). The site consists of three tracts of land designated as the northern, central, and southern tracts. Most of the landfill site is level to gently sloping, with one depression having steep slopes located on the southern end of the site. The landfill surface is primarily covered with well established vegetation ranging from brush to woodlands. During the Remedial Investigation (RI) Scattered drums, construction debris, tires, and household wastes were observed on the landfill surface. The site lies within the 100-year floodplain of the Ohio River. Therefore, if a major flood occurred it could cover 25 to 50 percent of the landfill causing two potential effects to the site: disturbance of the surface cover by the floodwaters and gradual erosion of the western bank of the landfill.

The site is bordered on the east and south by a flood protection levee. To the northeast is Borden, Inc., a chemical manufacturer, and to the south is the Louisville Gas and Electric Cane Run Plant (a coal-burning electric generating station). Other industrial development occupies some of the Kentucky side of the Ohio River from Louisville south to the Lees Lane Landfill area. Across the levee to the east of the site is Riverside Gardens, a residential development of about 330 homes and 1,100 people. The west side of the site has a narrow, terraced area which serves as a buffer zone between the landfill and the Ohio River. A gas collection system has been installed along the property boundary southeast of the site between the landfill and Riverside Gardens (see Figure 2).

The geology of the site area consists of approximately 110 feet of Ohio River alluvium and glacial outwash underlain by the New Albany shale, reported to be 100 feet thick. The alluvial aquifer is unconfined with the shale forming an aquitard between the alluvial aquifer and the deeper limestone aquifers. Both the alluvial and limestone aquifers are current and potential sources of drinking water. The water table begins approximately 50 feet below land surface and the saturated thickness of the alluvial aquifer is approximately 60 feet. The groundwater flow direction at the site is predominantly toward the Ohio River with a potential for groundwater flow under the river. During periods of high flow in the Ohio River, contaminant migration may reverse. However, in order for groundwater flow reversal to reach Riverside Gardens, the conditions necessary for flow reversal would have to be present for a long period of time.

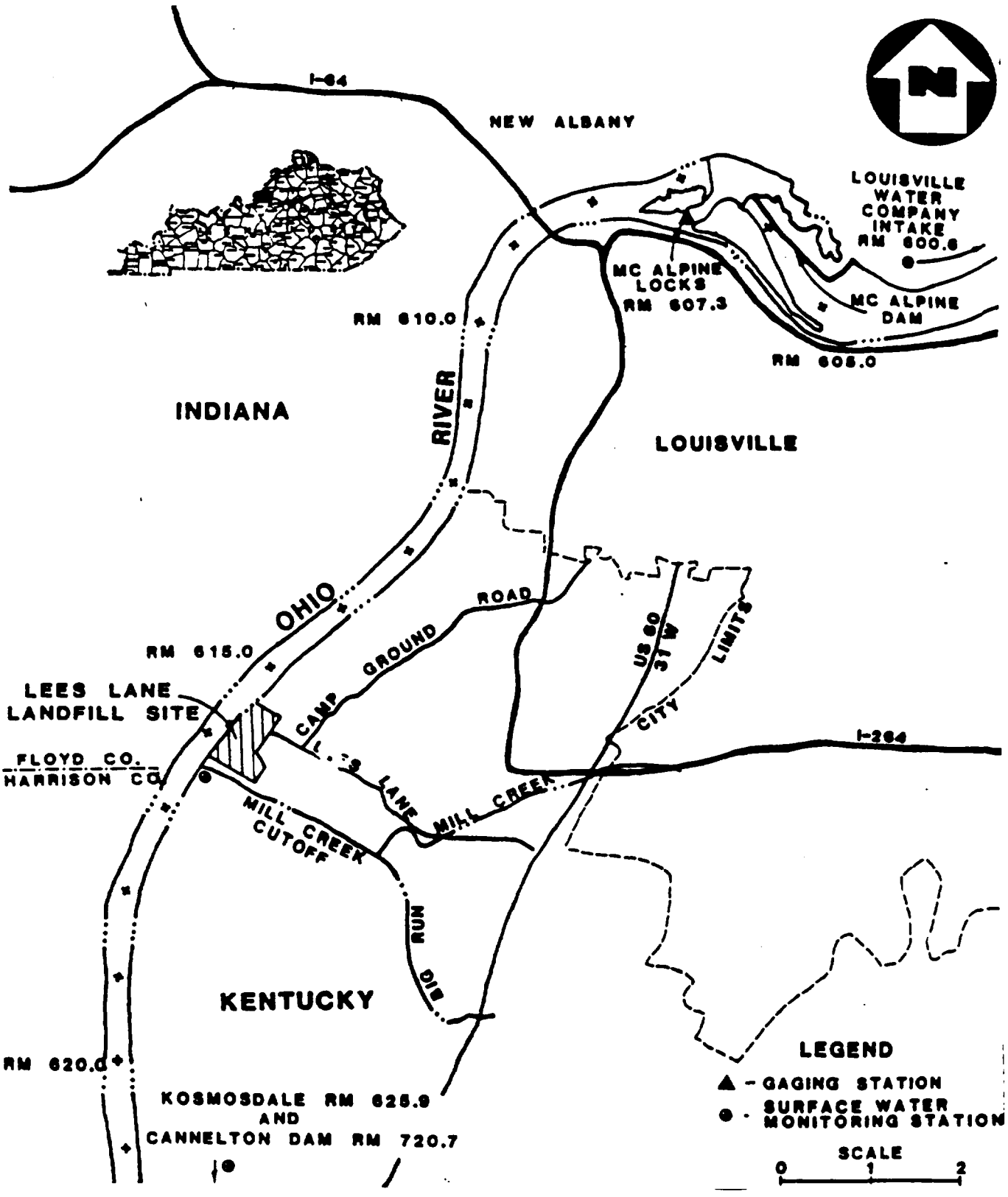

FIGURE 1
REGIONAL MAP
LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

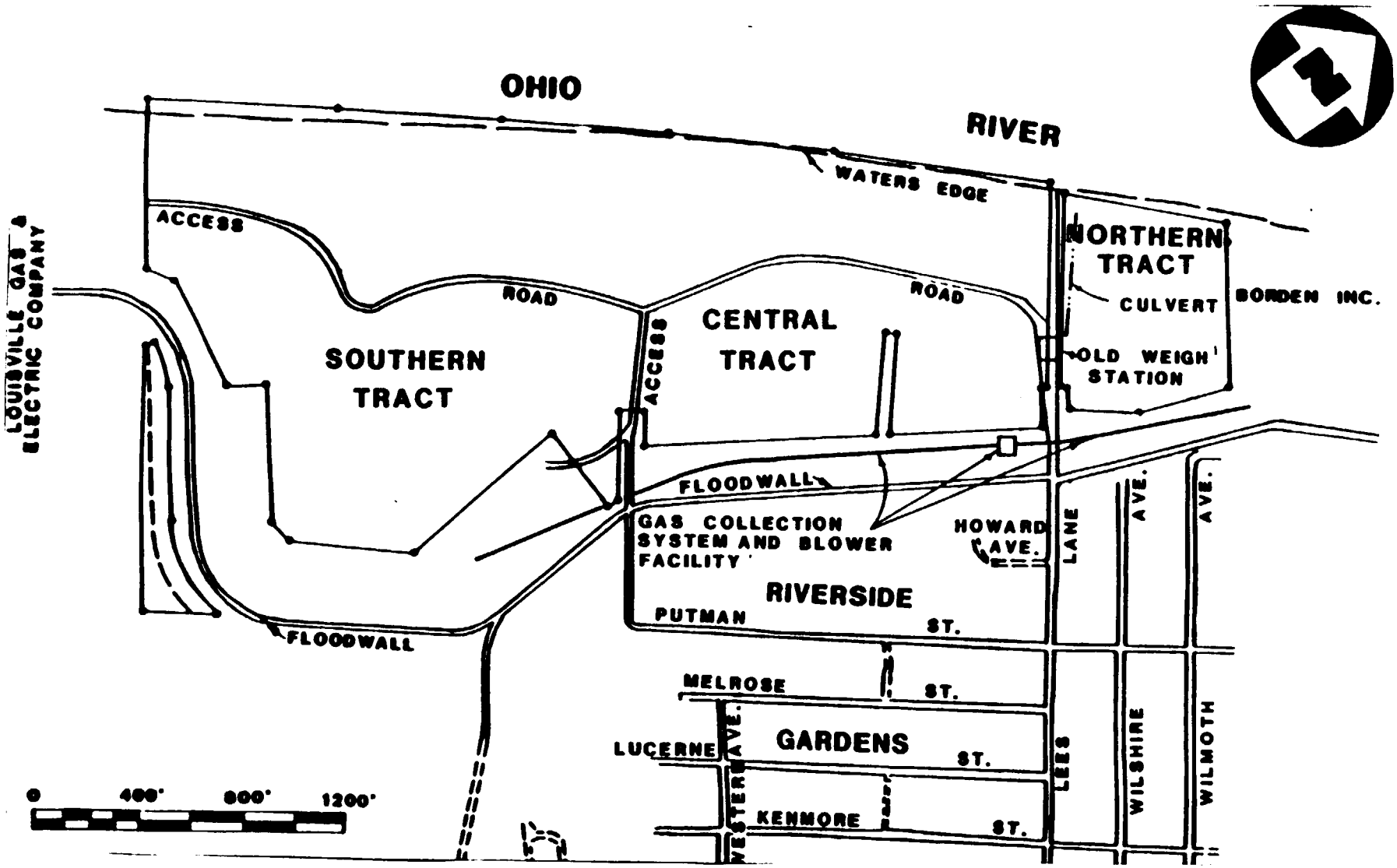

FIGURE 2

SITE LAYOUT, LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

SITE HISTORY

Land use at the Lees Lane Landfill site has included a sand and gravel quarry, a junkyard and a landfill. The period of sand and gravel operations at the site is not known but quarry operation began at least as early as the 1940s. The landfilling operations at the site were reported to have begun in the late 1940s.

The site received domestic, commercial, solid municipal, and industrial wastes over a 27-year period. Available historical records and responses to waste surveys identify that at least 212,400 tons of mixed industrial waste (some drummed) were disposed of at the Lees Lane Landfill by industrial firms from in and around the Louisville area.

Fill areas are located in the central and southern tracts and excavation areas in the northern and southern tracts. Background information for the site indicates that the northern tract excavation area was eventually filled with wastes but that the site was closed before the excavation area in the southern tract was completely filled. A large depression with ponded water now exists where remaining landfill capacity existed at the time of closure.

The southern tract of the site operated under a permit issued in 1971 by Kentucky under its Solid Waste Program. The permit expired in November 1974 and was not renewed by the State. In April 1975, the landfill was closed.

In March 1975, homeowners in Riverside Gardens, a community adjacent to the site, reported flash fires around their water heaters. A subsequent investigation detected explosive levels of methane gas and seven families were evacuated from homes near the site. These homes were ultimately purchased by the Jefferson County Housing Authority. In 1978, extensive monitoring was conducted to define the gas migration problem. A venting system was installed in October 1980.

In February 1980, the Kentucky Department of Hazardous Materials and Waste Management (HMWM) discovered approximately 400 drums on a terrace about 100 feet from the Ohio River bank. Over 50 chemicals were identified, including phenolic resins, benzene, and relatively high concentrations of copper, cadmium, nickel, lead, and chromium. In September and October of 1981, the drums were removed by the Lees Lane Landfill owners under court order. The hazardous wastes were removed from the drums and transported to an approved hazardous waste disposal facility. The remaining nonhazardous drummed materials and the empty drums were buried onsite.

In early 1981, Kentucky Natural Resources and Environmental Protection Cabinet (NREPC) installed shallow groundwater monitor wells at the site. The results showed high concentrations of heavy metals and aluminium. However, the analytical report stated that many of the sample concentrations were probably elevated due to excessive sediment in the samples caused by poor well construction.

The Lees Lane Landfill site was ranked on the National Priorities List (NPL) in December 1982. In May 1983, a Remedial Action Master Plan was completed by the NUS Corporation. In April 1986, the Remedial Investigation/ Feasibility Study (RI/FS) was finalized. This study was conducted by NUS-FIT Corporation.

Site Ownership

The Northern and Central Tracts were owned by Joseph C. Hofgesang until his death on March 10, 1972. Following his death, ownership went to the current owner, the Hofgesang Foundation, Inc., which is a private foundation set up in perpetuity. The Southern Tract was owned until the mid-1960s by Gernert Court, Inc. During the mid-1960s, the company's name was changed to the Joseph C. Hofgesang Sand Company, Inc. This company owned the site until the Kentucky solid waste permit expired in November 1974, at which time J. H. Realty, Inc. acquired it. J. H. Realty, Inc. is the current owner of the Southern Tract.

CURRENT SITE STATUS

Surface Water, Soil, and Groundwater

The Remedial Investigation identified contaminants in the following media: surface water, soil, and groundwater. Onsite surface water contained very low levels of contaminants. Onsite soils and sediments were similar to the offsite background sample collected in Riverside Gardens, suggesting the use of local soils as cover material. Typical offsite soil concentration levels included arsenic (24 mg/kg), barium (92 mg/kg), chromium (20 mg/kg), lead (50 mg/kg), manganese (1200 mg/kg) and iron (35,000 mg/kg). In two areas where "hot spot" soil samples were collected, the estimated concentrations of lead and chromium were 2000 mg/kg (ppm) each. These areas were located along the access road in the central tract. They are believed to be the result of indiscriminant dumping since the concentrations found were not representative of overall soil concentrations.

Onsite groundwater contained low levels of organic compounds and some inorganic contaminants. The major inorganic contaminants included arsenic (87 ug/l), barium (1,100 ug/l), cadmium (22 ug/l), chromium (640 ug/l), lead (150 ug/l), manganese (44,000 ug/l) and iron (190,000 ug/l). The offsite concentrations of these contaminants were all below the maximum contaminant levels (MCL) set in the Interim Primary Drinking Water Standards. Manganese was detected at 610 ug/l in the Louisville Gas and Electric well and at 370 ug/l in an Indiana public water supply (PWS) well. Iron was detected at 8,900 ug/l in an Indiana PWS well, but was below background in both industrial wells. Neither manganese nor iron are considered to have significant health effects.

From the contaminants detected in the RI, lead, arsenic, benzene and chromium were selected as critical contaminants for further evaluation. This selection was based on the frequency of detection and/or chemical, biological, and toxicological properties. Table 1-1 provides a summary of the range of concentrations of the critical contaminants found in the various media at the Lees Lane Landfill Site.

TABLE 1-1
CRITICAL CONTAMINANT LEVELS
IN VARIOUS MEDIA
LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

Critical Contaminant	Groundwater ug/l	Surface Water ug/l	Bottom Sediments mg/kg	Surface Soil mg/kg
Lead	0-150	0-10J	10J-100J	50J-2,000J
Arsenic	0-87	0	5.4-27	0-25
Benzene	0-450	0-5J	0-15J	0
Chromium	0-640	0-6.2	9.8-30J	10J-2,000J

J - Estimated value.

0 - Not detected.

Transport Routes - Groundwater

The major route for offsite migration of hazardous materials is groundwater discharge from the site. Most residents in the area use public water; however, approximately eleven homes still use domestic wells tapping the alluvial aquifer. Of these eleven wells, only eight are used for drinking water wells. Of the five drinking water wells sampled, no elevated contaminant levels were detected.

Public Health Assessment

A public health assessment was prepared to evaluate the potential health risks associated with the presence of hazardous substances at the site. This assessment concluded that the primary public health concern at the site was the elevated chromium levels found in onsite groundwater. In order to evaluate potential adverse health effects, the highest chromium concentration, 640 ug/l, detected in the onsite groundwater was used. Although unlikely, it is possible that drinking water containing 640 ug/l of chromium over a period of several years may lead to an increase in the chromium concentration of the liver and spleen. Chronic toxicological effects are possible at this level based on animal studies. No pathological changes have ever been associated with such low levels exposures. The dermal effects from bathing in water containing 640 ug/l would likewise appear remote, although chromium is recognized as a potent sensitizer of skin.

Gas/Air Migration Investigation

EPA tasked IT Corporation to inspect the site for gaseous contaminants and to determine the operational efficiency of the gas collection system. The samples from the gas extraction wells contained both methane and toxic gases demonstrating that the decomposition of landfill wastes is still producing gases with the potential to migrate via the subsurface or air to Riverside Gardens. The results of this investigation also indicated that the system was currently operating at less than 50% efficiency. Since 1980, Jefferson County has monitored the gas and the only time methane has been detected in the gas observation wells in Riverside Gardens was in April and May of 1984, at which time the blower system was not operating properly. This suggests, that although the system is operating at less than optimum efficiency, it is currently controlling lateral subsurface migration.

In November 1985, the Jefferson County Department of Public Works contracted SCS Engineers to inspect the gas collection system. Repairs of problem areas noted during the inspection were begun in December 1985 by Jefferson County under the supervision of SCS Engineers.

In January 1986, EPA launched an extensive air sampling study in order to respond to odor complaints by residents in Riverside Gardens (RG). The sampling plan was developed by EPA, KNREPC, Jefferson County Department of Health and the Agency for Toxic Substances and Disease Registry (ATSDR).

The objective of this plan was to determine if the RG residents are being adversely affected by methane or toxic gases detected in the atmosphere and if the source of these reported gaseous odors is the Lees Lane Landfill Site. The (January - June 1986) sampling program consisted of air/gas samples taken (1) from homes in Riverside Gardens, (2) at and around the vicinity of the landfill and (3) from the exhaust vent stack.

Results of these analyses showed organics present in the media sampled. However, all values were low (ppb). The conclusion drawn from this study is that the data collected does not suggest a health hazard for any potential receptors.

ENFORCEMENT ANALYSIS

EPA initially identified approximately 700-800 companies, individuals, and other entities as potentially responsible parties (PRPs) who had utilized the landfill for waste disposal. Several other companies were identified as PRPs from EPA waste survey forms.

EPA issued its first set of notice letters in June 1984 to the current and former owners and operators of the site, and to companies and individuals who may have disposed at the site. The notice letters offered the PRPs an opportunity to conduct the Remedial Investigation and Feasibility Study (RI/FS).

Many PRPs receiving the initial notice letters either failed to respond to the letter or gave inadequate responses. EPA mailed follow-up notice letters to a number of PRPs on April 1, 1985 in an effort to elicit full and complete responses to the June 1984 notice letters.

In December 1985, EPA issued a second set of notice letters to approximately 130 additional PRPs who had not received the initial notice letter. More than half of these letters were returned unopened to EPA. Further investigation indicated that most of the companies whose letters had been returned were no longer in business.

After reviewing all responses from the two rounds of notice letters, EPA determined that approximately thirty companies and individuals were considered to be PRPs, by virtue of either owning or operating the site, transporting hazardous substances to the site or arranging for disposal of hazardous substances at the site. Between January and March 1986, final notice letters were issued to 25 PRPs advising them that the RI/FS would be completed in March 1986. The letter also encouraged the PRPs to organize themselves into a steering committee for purposes of facilitating negotiation with EPA for the PRPs performance of the Remedial Design and Remedial Action (RD/RA). Consequently, a steering committee was formed by a group of PRPs.

EPA has received very positive indications from the PRPs that negotiations for the RD/RA will be successful. EPA presently anticipates that the consent order for RD/RA can be finalized and signed by September 30, 1986.

The Steering committee is aware that EPA has determined that alternative number three is the Agency's remedy of choice. The Steering Committee appears to be in agreement with this remedy and has not indicated to EPA that another remedy should be chosen.

Negotiations with the PRPs will not exceed 60 days. If the PRPs do not formally commit to perform the remedy with assurances that adequate funding is available to complete the remedy in a timely manner or if a consent order is not signed by September 30, 1986, EPA will proceed with a fund financed RD/RA.

ALTERNATIVES EVALUATION

The Remedial Investigation identified the following future potential public health concerns: 1) elevated chromium levels in the groundwater at and upgradient of the site and 2) the potential release of methane and hazardous gases to the air and subsurface. Since elevated chromium were detected in upgradient wells and no downgradient offsite impacts are evident, no remediation for groundwater was considered at this time.

Therefore, the public health objectives for this remedial action are as follows:

1. Construct a groundwater monitoring program that will serve as an early warning system should site conditions change.

2. Control the vertical and lateral subsurface migration of methane and other gases.

3. Institute a routine monitoring program that will serve to detect any undesirable and possible dangerous levels of methane and/or toxic vapors migrating into the Riverside Gardens neighborhood.

4. Institute an ambient air monitoring program.

The Remedial Investigation concluded that the concentrations of the critical contaminants do not represent a significant threat to the environmental receptors (i.e. plant and animal life) at the Lees Lane Landfill site. Biota in continued direct contact with elevated contaminant levels in selected "hot spot" soil areas may experience symptoms of chronic toxicity; however, no acute toxicological effects would be expected at the current contaminant levels.

Initial Screening of Remedial Action Technologies

A list of preliminary, applicable technologies was developed based on RI data. This list comprised actions that addressed the potential site problems and pathways of contamination identified during the RI. These technologies were then evaluated relative to the following criteria:

(1) technical considerations (reliability, implementability, etc.)

(2) public health and environmental considerations

(3) institutional considerations (permits, other laws, etc.)

(4) cost considerations

If the technology was rejected for use at the site under a particular criterion, it was eliminated from further consideration. (See Table 1-2 for the response action and the rationale for elimination of a particular technology).

Remedial Action Alternatives Retained For Detailed Evaluation

The NO-ACTION Alternative was evaluated in accordance with technical, public health and environmental criteria to determine the effect of not performing additional remedial actions at the site. Under this alternative the low level contamination of the groundwater could continue. Changes in groundwater contaminant level would not be detected, due to the absence of groundwater monitoring. Similarly, the gas collection system may deteriorate and an unknown quantities of gases may be released to the air or migrate into nearby homes, leading to an increased health risk.

The remaining alternatives (Alternatives 1-6) were subjected to detailed analyses involving both non-cost and cost criteria. Non-cost criteria included technical, public health, environmental, and institutional considerations. See Table 1-3 for a summary of remedial action alternatives. Each alternative was assessed for its effect upon the existing floodplains and wetlands. Cost criteria included capital costs, operation and maintenance costs and a present worth calculation. See Table 1-4 for a cost summary of the six alternatives described below:

Alternative 1 - No Remedial Action - Monitoring
Alternative 2 - Gas Collection and Venting System, and Monitoring
Alternative 3 - Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring

Alternative 4 - Capping, Regrading and Revegetation, Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring
Alternative 5 - Excavation and Backfilling, Regrading and Revegetation, Onsite Incineration, Offsite Fly Ash Disposal, and Monitoring
Alternative 6 - Excavation and Backfilling, Regrading and Revegetation, Offsite Disposal, and Monitoring

TABLE 1-2

SCREENING ALTERNATIVE TECHNOLOGIES FOR
APPLICABILITY TO LEES LANE LANDFILL SITE

Remedial Technologies	Retained (R) or Eliminated (E)	Reason Eliminated
No Action		
° No Action	R	
° Monitoring	R	
Alternate Water Supply		
° Municipal Water Supply Hookup	R	
° Bottled Water	E	Short-term solution
° Individual Treatment Units	E	Requires extensive monitoring and maintenance
Containment		
° Surface Capping-Clay	R	
° Bank Protection Controls-Riprap	R	
° Groundwater Barriers	E	Serious construction problems
Diversion		
° Surface Regrading and Revegetation	R-if capping or excavation are performed	
° Levees	E	Additional flooding would be caused downstream and floods exceeding the 100-year event would overlap the new levee and create turbulence.
° Terraces and Benches	R	

TABLE 1-2 (Continued)

Remedial Technologies	Retained (R) or Eliminated (E)	Reason Eliminated
Collection		
° Leachate Collection	E	Impractical and Infeasible
° Gas Collection and/or venting	R	
° Groundwater Collection	E	Extraction of groundwater from beneath the site through the use of pumping wells is judged not practical and/or effective
Reduction		
° Removal and/or control of surface waste	R	
On-site Treatment		
° Leachate Treatment	E	Leachate collection eliminated
° Incineration-Rotary Kiln	R	
Off-site Treatment		
° Leachate Treatment	E	Leachate collection eliminated
Incineration	E	Problems involved with storage and handling requirements of waste
In-situ Treatment		
° Inplace Treatment of Soils	E	Due to depth of contaminated soils and the unknown nature of waste
Complete Removal		
° Removal of contaminated soil/sediment	E	Levels of contamination in surface media are very low and present no health or environmental hazards

TABLE 1-2 (continued)

Remedial Technologies	Retained (R) or Eliminated (E)	Reason Eliminated
Off-site Disposal		
° Landfilling	R	
° Incineration	R	
On-site Disposal		
° Landfilling	E	Site lies within the 100 year floodplain. A new landfill could not be constructed in a floodplai consistent with RCRA regulations.
° Incineration	R	

TABLE 1-
SUMMARY OF REMEDIAL ACT. ALTERNATIVES
LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

Alternative	Cost ($) 1,000 Actual	Cost ($) 1,000 Present Worth	Public Health Concern	Environmental Concern	Technical Concern	Other Concerns
No Action	0	0	Gas migration and direct contact with surface wastes	Leachate and waste release to Ohio River	-	Community disapproval
No Remedial Action Monitoring	391	341	Gas migration and direct contact with surface wastes	Leachate and waste release to Ohio River	-	Community disapproval
Gas Collection and Venting System, and Monitoring	647	439	Direct contact with surface wastes	Leachate and waste release to Ohio River	-	-
Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring	2,909	2,682	Minimal	Leachate release to Ohio River	-	-
Capping, Regrading and Revegetation, Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring	42,683	15,946	Minimal	Leachate release to Ohio River	Time for implementation Cap damage from Ohio River runon during flooding	Transportation of capping material through Riverside Gardens
Excavation and Backfilling, Regrading and Revegetation, Onsite Incineration, Offsite Fly Ash Disposal, and Monitoring	418,112	165,766	Gas and particulate migration during excavation	Migration of wastes from flooding during excavation	Coordination of excavation and incineration. Time for implementation	Transportation of wastes through Riverside Gardens
Excavation and Backfilling, Regrading and Revegetation, Offsite Disposal, and Monitoring	649,279	261,538	Gas and particulate migration during excavation	Migration of wastes from flooding during excavation	Coordination of excavation and transportation of wastes. Time for implementation	Transportation of wastes through Riverside Gardens

TABLE 1-4

SUMMARY OF CAPITAL O&M AND PRESENT WORTH COST FOR
REMEDIAL ACTION ALTERNATIVES LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

Alternatives	Capital Costs ($) 1,000		O&M Costs ($) 1,000*		Total Cost ($) 1,000	
	Actual	Present Worth	Actual	Present Worth	Actual	Present Worth
1	106	106	285	235	391	341
2	132	132	515	307	647	439
3	2,343	2,343	566	339	2,909	2,682
4	42,067	15,589	616	357	42,683	15,946
5	39,906	24,051	378,206	141,715	418,112	165,766
6	648,971	261,295	308	243	649,279	261,538

* O&M Costs are shown for a three-year period.

Alternative 1: No Remedial Action - Monitoring

This alternative does not address the remediation of the site nor the potential threat to the public or the environment via the contamination pathways. However, a multi-media monitoring program will provide information so that possible adverse public health or environmental impacts that may arise can be addressed. Based upon the conclusions of the Remedial Investigation (RI), gas migration is considered a significant problem at the site. Therefore, at a minimum, an air monitoring program would be implemented followed by the installation of gas monitoring wells, and implementation of the gas and groundwater monitoring programs.

Alternative 2: Gas Collection and Venting, and Monitoring

This alternative includes a gas, air, and groundwater monitoring program, the provision of a properly operating gas collection system and consideration of a possible future alternate water supply. Any problems remaining in the gas collection system would be corrected after a determination of the extent of the necessary modifications to the system is made. Implementation of this alternative would ensure that gas migration, the most significant potential problem at the site, is addressed.

Alternative 3: Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring

This alternative includes the monitoring program described in Alternative 1, the provision of a properly operating gas collection system, consideration of a future alternate water supply, cleanup of the surface waste areas, and bank protection controls. The monitoring program included in this and the following alternative contains provisions for the sampling of an additional groundwater monitor well to aid in determining alternate concentration limits (ACLs). Surface waste cleanup would involve removal of exposed drums, capping of "hot spot" soils and an area containing exposed trash. The drums would be analyzed prior to excavation and removed to an approved landfill. Riprap would be installed to minimize erosion potential and failure of the Ohio River embankment. The entire bank (29 acres) along the Ohio River would be stabilzed. In addition, cautionary signs, will be posted. One gate would be installed at the Putnam Street access point.

Alternative 4: Capping, Regrading and Revegetation, Surface Waste Area Cleanup, Bank Protection Controls, Gas Collection and Venting System, and Monitoring

In addition to monitoring, surface waste area cleanup, bank protection controls, gas collection and venting system, and consideration of a possible future alternate water supply, a cap would be installed over the entire landfill to minimize leachate generation from infiltrating rainfall and to control vertical movement of gas. Regrading and revegetation will be neccessary to provide maximum drainage of the area. Both the capping and bank protection controls would require some clearing of vegetation.

This onsite alternative will comply with other appropriate environmental laws. The cap described above would meet the criteria outlined in RCRA.

Alternative 5: Excavation and Backfilling, Regrading and Revegetation, Onsite Incineration, Offsite Fly Ash Disposal, and Monitoring

The site is estimated to have a total volume of 4,400,000 cubic yards; however, based on site sampling, ferromagnetic surveys, and historial photographs approximately 2,400,000 cubic yards will be excavated. The depth of excavation will vary widely at the site ranging from 5 feet in portions of the central tract to 40 feet in parts of the northern tract of the landfill. Backhoes and power shovels will be used for the removal of surface material and any additional dry fill, while draglines will be employed for the removal of wet fill. Following excavation the site will be backfilled, regraded and revegetated. Backfilling will be conducted concurrently with excavation to maintain the integrity of the landfill and prevent the accumulation of water. Backfill material will be brought from offsite sources, since no onsite source is available. After segregation of the 2,400,000 cubic yards of waste excavated, approximately 1,560,000 cubic yards are expected to be suitable for incineration and the remainder should be segregated and disposed of at an appropriate landfill.

Byproducts of the incineration process include products of incomplete combustion, fly ash, and atmospheric emissions. The fly ash, due to potentially high metals concentrations, will be disposed of in an approved RCRA landfill. Atmospheric emissions will be controlled by a venturi scrubber, with scrubber water neutralized with lime prior to discharge. Additional treatment of existing gases and wastewater may be required and will be evaluated prior to construction.

This alternative will include the monitoring program discussed in Alternative 1.

Alternative 6: Excavation and Backfilling, Regrading and Revegetation, Offsite Disposal, and Monitoring

In addition to monitoring, this alternative will result in the excavation and offsite disposal of approximately 2,400,000 cubic yards of fill in a RCRA approved landfill. Excavation and backfilling, regrading and revegetation have been described in Alternative 5.

Comparsion of Remedial Alternatives

The NO-ACTION alternative did nothing to remedy public health and environmental concerns (i.e. direct contact to "hot spot" areas, the potential for gas migration to impact Riverside Gardens, and possible migration of contaminated groundwater). These actions were determined to be a necessary part of any remedy. Therefore, the NO-ACTION alternative was eliminated from further consideration.

The NO-ACTION - MONITORING alternative would not reduce or eliminate any of the impacts resulting from the site contaminants. It would only provide information about the movement of the contaminants so that future remedial actions could be taken when necessary. Public health concerns such as gas migration and direct contact with surface waste would not addressed; therefore, this alternative was eliminated.

ALTERNATIVE 2 which includes a properly operating gas collection and venting system in addition to a monitoring program was also eliminated from further consideration because all applicable public health concerns were not addressed (i.e. direct contact to "hot spot" areas).

ALTERNATIVE 3 would address the potential release of methane and hazardous gases to the air and subsurface by providing for a gas and air monitoring system. It would also provide for a groundwater monitoring program to establish baseline conditions at the site and also to serve as an early warning of contaminant migration. Riprap would be installed to prevent erosion of the Ohio River bank. Direct contact to hot spot areas and exposed drums would be remediated by capping "hot spot" areas and removing drums. The remedial action components described above would achieve the public health and environmental objectives established in the Remedial Investigation at the lowest cost; therefore, it was chosen as the preferred alternative.

ALTERNATIVE 4, landfill capping, a well documented technology, would serve to minimize the generation of leachate resulting from surface water infiltration and control vertical movement of gas generated in the landfill However, capping was not considered appliable for the site due to the following reasons: (1) the site lies in a floodplain, (2) capping the site would enhance the lateral migration of gases and possibly exacerbate the problems with the gas collection and venting system, (3) the site is well-vegetated with trees, shrubs, and brushes etc; capping would involve clearing the site and re-vegetating the area, and (4) implementation of this remedy could require a long period of time to complete (22 years) and (5) the potential public health risk associated with the transport of large amount of waste through the neighborhood. Therefore, Alternative 4 was eliminated.

ALTERNATIVE 5, onsite incineration, is also a well-established technology and would effectively destroy all principal organic hazardous constituents found in the waste material. However, this technology would not be suitable for the decompostion of many of the metals found onsite. The implementation of Alternative 5 has the potential to significantly impact public health. During the excavation procedure, especially with methane gas present, the opportunity for offsite migration of contaminants is greatly increased. Pathways for this migration include airborne particulates gas emission and surface runoff. Receptors in the area would be susceptible to inhalation of gas as well as contaminant laden particulates, the ingestion of particules and direct contact with wastes. The technical feasibility associated with this remedy is also of concern. The implementation time associated with costs for this alternative is 24 years.

ALTERNATIVE 6, disposal of waste in an offsite landfill, is a permanent remedial action and would provide a very high level of environmental and public health protection at the site. It would prevent any further movement contamination. Implementation problems associated with this remedy include coordination and transporation of a large quantity (2,400,000 cubic yds.) of material to be excavated. Due to the volume to be disposed, it may be necessary to utilize more than one landfill facility.

The costs for implementation of Alternatives 5 and 6 would be $418,112,000 and $649,279,000, respectfully. These costs are two orders of magnitude higher than Alternative 3 which also addresses the identified public and environmental concerns at the site. Therefore, selection of these alternatives would not be cost effective.

COMMUNITY RELATIONS

A public meeting was held on October 14, 1985, to present a summary of the RI/FS process and to explain the proposed remedies for the cleanup of the landfill. To aid in this presentation a fact sheet was prepared for the meeting. The public comment period officially closed on Nov. 6, 1985. Comments received were responded to and are in summary form in the attached Responsiveness Summary.

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

The NCP requires that other environmental laws be considered in determining the appropriate action for the site. Other environmental laws which may be applicable or relevant and appropriate to the recommended alternative are the Resource Conservation and Recovery Act (RCRA), Floodplain Management Executive Order (E.O. 11988) and the Wetland Executive Order (E.O. 11990).

The provisions of RCRA applicable to the recommended alternative at Lees Lane Landfill would be 40 CFR Part 263, Standards Applicable to Transporters of Hazardous Waste, and the 40 CFR 264 subpart F Groundwater Protection Standards. The regulations set forth in 40 CFR Part 263 would apply to the transportation of the drums removed. Transporters are required to obtain an EPA identification number, register the material in accordance with the manifest system requirements and perform analyses of the drum contents to meet these requirements.

The RCRA Groundwater Protection Standards require corrective action if hazardous constituents are found in groundwater in excess of established concentration limits or above background levels. However, if it can be demonstrated that an alternative concentration limit (ACL) will not pose a substantial present or potential hazard to human health or the environment, then corrective action is not required. The current groundwater conditions does not present an immediate threat to the public health and the environment. Based on the hydrogeology at the site, it is expected that two years of

groundwater data will have to be assembled before the ACL demonstration process can be initiated. The proposed monitoring systems will enable us to establish an ACL for this site. After ACLs are established the Agency will decide if further groundwater remedies are necessary.

The Floodplain Management Executive Order may not be applicable because the excavation and removal of the exposed drums and "hot spot" and bank protection controls should have little effect on the floodplain. The Wetland Executive Order would not be applicable because this alternative involves remedial methods outside the wetland area.

RECOMMENDED ALTERNATIVE

Alternative 3 was chosen as the recommended alternative for implementation at the Lees Lane Landfill site. This alternative is cost effective and will effectively mitigate and minimize threats to and provide adequate protection of public health, welfare and the environment. The total capital costs associated with this remedy is $2,343,000. The capital cost for surface waste area cleanup is sensitive to the number of drums and size of areas to be covered. Due to the variable nature of drum removal a 15 percent factor was used for the sensitivity analysis. The bank protection controls are sensitive to the total area to be protected and cleared and a variation of 20 percent in capital costs was used in the sensitivity analysis. These variations resulted in a range costs from $2,243,000 to $3,123,000.

OPERATION AND MAINTENANCE (O & M)

Operation and maintenance activities include inspection of the gas monitoring wells, quarterly gas and groundwater sampling and analysis, and sampling of air three times per year. Other O & M activities include inspection and maintenance of the gas collection system, capped waste areas, and the riprap along the Ohio River bank.

The total projected O & M costs excluding the O & M costs for monitoring gas, groundwater, and air after the 3rd year is $566,000. After three years of monitoring, the monitoring plan will be re-evaluated by EPA. (See Table 1-5 for cost summary of capital and O & M cost).

SCHEDULE

ACTIVITY	DATE
Finalize EDD	September '86
Sign Consent Order	September '86
Draft Remedial Action Plan Deliverable	November '86

TABLE 1-5
COST SUMMARY - SURFACE WASTE AREA CLEANUP, BANK PROTECTION CONTROLS, GAS COLLECTION SYSTEM, AND MONITORING
LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

A. Estimation of Costs(1)

Alternative Components	Time to Construct (Yr.)	Capital Costs ($)	O & M Costs ($) Period (Yr.)	O & M Costs ($) Annual ($)	O & M Costs ($) Total ($)	Total Costs ($)
1. Monitoring	1	105,000	1 3	24,000(2) 94,870	309,000	414,000
2. Gas Collection System	1	26,000	30	7,680	230,000	256,000
3. Surface Waste Areas	1	294,000	30	120	3,600	298,000
4. Bank Protection Controls	1	1,917,000	30	770	23,000	1,940,000
5. Gate and Signs	1	1,000	-	-	-	1,000
Total Costs		**2,343,000**		**127,440**	**566,000**	**2,909,000**

(1) All costs are rounded to the nearest 1,000 dollars, except O & M.

(2) Costs for complete Appendix VIII analyses on one well quarterly the first year.

FUTURE ACTIONS

Future actions at the site will include Operation and Maintenance activities.